

# Improved Reading Skills by Students in the Virginia Department of Correctional Education who used Fast ForWord® Products

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## ABSTRACT

**Purpose:** This study investigated the effects of the Fast ForWord products on the reading skills of students who were attending schools in the Virginia Department of Juvenile Justice. **Study Design:** The design of the study was a multiple facility experimental study using nationally normed tests. **Participants:** Study participants were 29 students in two juvenile correctional facilities in the Virginia Department of Juvenile Justice. **Materials & Implementation:** Following staff training on the Fast ForWord products, the students used the products during the 2003 – 2004 year. Before and after Fast ForWord participation, students were tested with the Broad Reading Cluster of the Woodcock-Johnson Tests of Achievement or the STAR Reading assessment. **Results:** On average, students made significant improvements in their reading skills after participation on the Fast ForWord products, gaining one and a half years in reading abilities.

**Keywords:** Virginia, correctional facility, observational study, Fast ForWord Middle & High School, Woodcock-Johnson Tests of Achievement, STAR Reading assessment, technology integration.

## INTRODUCTION

Numerous research studies have shown that cognitive and oral language skills are under-developed in struggling readers, limiting their academic progress (Lyon, 1996). University-based research studies reported the development of a computer software product that focused on learning and cognitive skills, and provided an optimal learning environment for building the memory, attention, processing and sequencing skills critical for reading success (Merzenich et al., 1996; Tallal et al., 1996). This prototype of the Fast ForWord Language software showed that an optimal learning environment and focus on early reading and cognitive skills resulted in dramatic improvements in the auditory processing and language skills of school children who had specific language impairments (Merzenich et al, 1996; Tallal et al., 1996) or were experiencing academic reading failure (Miller et al., 1999). The Virginia Department of Correctional Education was interested in evaluating the effectiveness of an optimal learning environment with a focus on early reading and cognitive skills as a way for improving the reading achievement of students in state correctional facilities. Technology options are employed in the Department of Correctional Education (DCE) to achieve the goal of improving the academic achievement of incarcerated youth (Clair, 2003). In this study, commercially available computer-based products (Fast ForWord Middle & High School and Fast ForWord Language to Reading) were used to evaluate the effectiveness of this approach at improving the reading achievement of students in correctional facilities.

## METHODS

### Participants

Twenty-nine students participated in this study and had Woodcock Johnson Broad Reading cluster or STAR Reading assessment scores from before and after Fast ForWord participation available for analysis. These 29 students were initially from a group of 135 students from two juvenile correctional facilities in the Virginia Department of Correctional Education who used the Fast ForWord products during the 2003 – 2004 year.

The Department of Correctional Education (DCE) is an independent school district with its own school board that operates in cooperation with the Virginia Department of Corrections and the Department of Juvenile Justice. DCE juvenile schools are accredited by the Virginia Department of Education. The DCE serves as Virginia's prison education system for youth and adult offenders. Among its facilities are 24 adult correctional centers, 13 correctional field units, 7 juvenile correctional centers and one youth reception center. There is a full-time staff of 784, 80% of whom are directly involved in the instructional process.

### Implementation

At each participating correctional facility, educators were trained in current and established neuroscience findings on how phonemic awareness and the acoustic properties of speech impact rapid development of language and reading skills; the scientific background validating the efficacy of the products; methods for assessment of potential candidates for participation; the selection of appropriate measures for testing and

evaluation; effective integration of technology; approaches for using Progress Tracker reports to monitor student performance; and techniques for measuring the gains students have achieved after they have finished using Fast ForWord products.

### Materials

The Fast ForWord Middle & High School and Fast ForWord Language to Reading products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The products include five to six exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension. While there are differences between these products, both help develop certain critical skills as detailed in the following exercise descriptions.

*Sweeps<sup>1</sup>, and Trog Walkers<sup>2</sup>*: Students hear a series of short, non-verbal tones. Each tone represents a different fragment of the frequency spectrum used in spoken language. Students are asked to differentiate between these tones. The exercises improve working memory, sound processing speed, and sequencing skills.

*Streams<sup>1</sup>*: Students hear a single syllable that is repeated several times, and then interrupted by a different syllable. Students must respond when they hear the change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

*IDs<sup>1</sup>, Polar Cop<sup>2</sup>, and Treasure in the Tomb<sup>2</sup>*: Students hear a target phoneme, and then must identify the identical phoneme when it is presented later. These exercises improve auditory discrimination skills, increase sound processing speed, improve working memory, and help students identify a specific phoneme. *Polar Cop* also develops sound-letter correspondence skills. *Treasure in the Tomb* also develops grapheme recognition.

*Matches<sup>1</sup>, and Bug Out<sup>2</sup>*: Students choose a square on a grid and hear a sound or word. Each sound or word has a match somewhere within the grid. The goal is to find each square's match and clear the grid. The *Phonic Match* exercise develops auditory word recognition and phoneme discrimination, improves working memory, and increases sound processing speed. The *Bug Out!* exercise develops skill with

sound-letter correspondences as well as working memory.

*Cards<sup>1</sup>*: Students see two pictures representing words that differ only by the initial or final consonant (e.g., “face” versus “vase”, or “tack” versus “tag”). When students hear one of the words, they must click the picture that matches the word. This exercise increases sound processing speed, improves auditory recognition of phonemes and words, and helps students gain an understanding of word meaning.

*Stories<sup>1</sup> and Start-Up Stories<sup>2</sup>*: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

### Assessments

Student reading ability was evaluated with either the Broad Reading cluster of the Woodcock Johnson Tests of Achievement or the STAR Reading assessment before and after participation on the Fast ForWord products. Scores were reported in terms of grade-equivalence.

#### Woodcock-Johnson Tests of Achievement- Broad Reading

**(WJBR):** The Broad Reading cluster comprises two subtests from the Woodcock Johnson Tests of Achievement, Third Edition: Letter-Word Identification and Passage Comprehension. The Letter-Word Identification subtest measures a student's reading identification skills for isolated letters and words. The Passage Comprehension subtest measures a student's skill in reading a short passage and identifying a missing key word.

**STAR Reading:** The STAR Reading assessment is a criterion- and norm-referenced test of reading ability. It consists of computer adaptive multiple choice questions and is appropriate for grades 1 through 12.

### Analysis

All assessments were administered by school personnel. Scores were reported in terms of grade-equivalents. Data was analyzed using dependent t-tests and all analyses used a p-value of 0.05 as the criterion for identifying statistical significance.

## RESULTS

### Participation Level

Research conducted by Scientific Learning shows a relationship between product use and the benefits of the product. Product use is composed of days of use, content completed, and adherence to the chosen protocol (participation level). The facilities chose to use both the 48-Minute and the 90-Minute protocols for the Fast ForWord Middle & High School and Fast ForWord Language to Reading products. These protocols require students to use the products 48 minutes a day, five days per week for eight to twelve weeks, or 90 minutes a day, five days a week, for four to eight weeks, respectively.

<sup>1</sup> Exercise from the Fast ForWord Middle & High School product.

<sup>2</sup> Exercise from the Fast ForWord Language to Reading product.

Students in two juvenile correctional facilities in Virginia used the Fast ForWord products during 2003 – 2004. Eleven students at the Cedar Mountain High School, Culpeper Juvenile Correctional Center used the Fast ForWord Middle & High School product and had STAR scores pre- and post-participation. Nine of these students also used the Fast ForWord Language to Reading product. Eighteen students at the Joseph T. Mastin Expansion High School, Bon Air Expansion Juvenile Correctional Center used the Fast ForWord Middle & High School product and had Woodcock Johnson Broad Reading scores available. Three students went on to use the Fast ForWord Language to

Reading product. Detailed usage information for each product is shown in Table 1.

Figures 1 and 2 show the average daily progress through the Fast ForWord Middle & High School and the Fast ForWord Language to Reading exercises for the students who had WJBR or STAR scores available. The final day shown on each graph is determined by the maximum number of days that at least two-thirds of the students participated. For students who used the products fewer than the number of days shown, percent complete is maintained at the level achieved on their final day of product use.

School	Fast ForWord Product	Number of Students	Number of Days	Calendar Days	Percent Complete	Participation Level
Joseph T. Mastin Expansion High School	Middle & High School	18	21	182	53%	9%
	Language to Reading	3	2	NA	NA	NA
Cedar Mountain High School	Middle & High School	11	21	156	58%	13%
	Language to Reading	9	21	190	40%	8%

Table 1. Usage data showing the number of students who used each Fast ForWord product along with group averages for the number of days of product use, calendar days between start and finish, percentage of content completed and participation level.

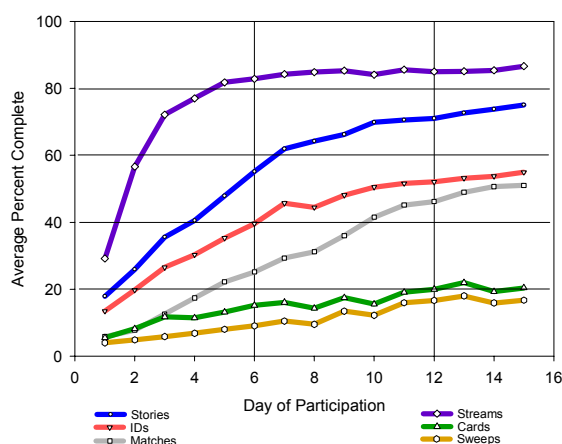


Figure 1. Average daily progress of students using the Fast ForWord Middle & High School product. Results from 29 students are shown.

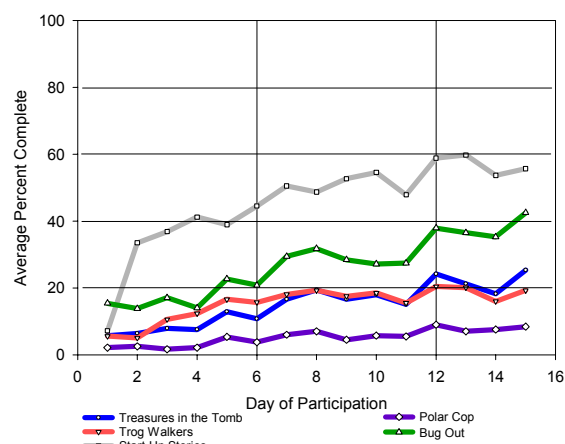


Figure 2. Average daily progress of students using the Fast ForWord Language to Reading product. Results from 12 students are shown.

## Assessment Results

**Woodcock Johnson Tests of Achievement- Broad Reading:** Students at the Joseph T. Mastin Annex High School were reading, on average, at a high 6<sup>th</sup> grade level before participation on the Fast ForWord products. The students' actual average grade level was 8.3. After using the Fast ForWord products, students, on average, made significant improvements in their reading abilities and moved closer to their actual grade level. On average, students achieved significant improvement, increasing their reading skills by 1.5 years after participating on the Fast

ForWord products for 10 months (Figure 3 and Table 2).

**STAR Reading:** Before using the Fast ForWord products, students at the Cedar Mountain High School were, on average, performing at a mid 6<sup>th</sup> grade reading level and had an actual grade level of 9.8. On average, after participating on the Fast ForWord products, students showed significant improvements in their reading skills, gaining nearly 1.5 years in four months time (Figure 4 and Table 2).

In addition to increased reading ability, DCE teachers observed that students who participated in the Fast ForWord programs were more focused and exhibited improvements in behavior. This was especially true of students identified with Attention Deficit Disorder (ADD) and Attention Deficit Hyperactive Disorder (ADHD). Moreover, teachers reported that some students demonstrated a stronger interest in reading as a result of their participation in the program.

	n	Before		After		t-statistic
		Mean	SE	Mean	SE	
WJBR	18	6.7	0.61	8.3	0.63	7.68*
STAR	11	6.5	1.07	7.8	0.98	3.25*

Table 2. Twenty-nine students who used Fast ForWord products made significant improvements in their reading abilities, improving 1.5 years in a four to ten month time. \* $p < 0.05$

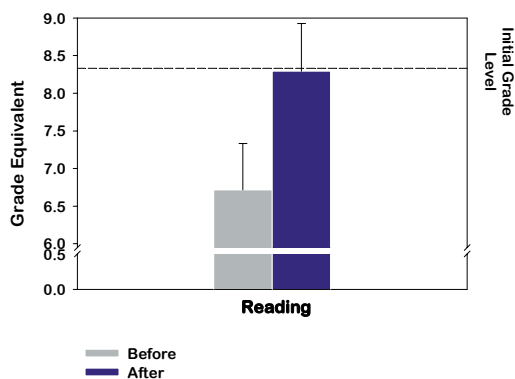


Figure 3. Grade equivalents from before and after participation on the Fast ForWord products show that, on average, 18 students made significant improvements in their reading grade level.

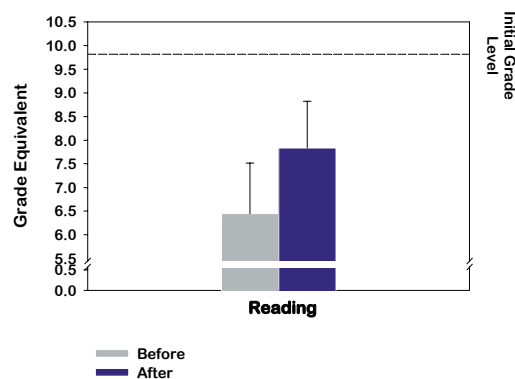


Figure 4. Eleven students, on average, gained nearly one and a half years in reading skills after participation on the Fast ForWord products.

## DISCUSSION

Correctional facilities provide challenging educational environments. Students routinely miss activities due to lock-downs and are incarcerated for varying lengths of stay, resulting in many students moving prior to post tests. Despite the challenges, students in two juvenile correctional facilities in the Department of Correctional Education used the Fast ForWord products during the 2003 – 2004 school year with good results. Students in both facilities made significant improvements in their reading abilities after Fast ForWord participation.

On average, before using the Fast ForWord products, students had reading skills well below their grade level. After participation, students, on average, gained 1.5 years in reading abilities and moved closer to their actual grade level.

This ability to accelerate the reading acquisition of this population of students is extremely important given that the majority of offenders have learning disabilities and a history of low reading achievement. The DCE provides testing and educational assessments for all youth and adult offenders as well as special education

services for identified youths and adults. Forty-six percent of youths and 12% of adults receive special education services (Virginia Secretary of Public Safety, 2004).

## CONCLUSION

Language skills are critical for all students, impacting their ability to benefit from instruction, follow instructions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. Scores from before and after Fast ForWord participation show that, on average, students made significant increases in their reading abilities. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

### Notes:

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## REFERENCES

Clair, S.M. (2003). *Increasing the academic achievement of incarcerated youth through technology (Policy Papers in Education Monograph)*. Washington, DC: The George Washington University, Center for Curriculum, Standards, and Technology, Institute for Educational Policy Studies.

Lyon, G.R. (1996). Learning Disabilities. *The future of children: Special education for students with disabilities*. 6:54-76.

Merzenich MM, Jenkins WM, Johnston P, Schreiner CE, Miller SL, & Tallal P (1996). Temporal processing deficits of language-learning impaired children ameliorated by training. *Science*, 271, 77-80.

Miller, S.L., Merzenich, M.M., Tallal, P., DeVivo, K., Linn, N., Pycha, A., Peterson, B.E., Jenkins, W.M., (1999). Fast ForWord Training in Children with Low Reading Performance, *Nederlandse Vereniging voor Lopopedie en Foniatrie: 1999 Jaarcongres Auditiieve Vaardigheden en Spraak-taal*. (Proceedings of the 1999 Dutch National Speech-Language Association Meeting).

Renaissance Learning. (2002). *STAR Reading*. Madison, WI: Renaissance Learning, Inc.

Tallal P, Miller SL, Bedi G, Byma G, Wang X, Nagarajan SS, Schreiner C, Jenkins WM, Merzenich MM (1996). Language comprehension in language-learning impaired children improved with acoustically modified speech. *Science* 271:81-84.

Virginia Secretary of Public Safety (2004) *The Virginia Department of Correctional Education "fighting crime through education"* from the State of Virginia, Secretary of Public Safety Web site: <http://www.publicsafety.virginia.gov/Spotlights/dceOct2003/dce.cfm>

Woodcock, R., McGrew, K., Mather, N. (2001). *Woodcock Johnson Tests of Achievement*. Itasca, IL: Riverside Publishing.